mir-17-92: a polycistronic oncomir with pleiotropic functions.

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Public Summary:
Neoplastic transformation is caused by accumulation of genetic lesions that ultimately convert normal cells into tumor cells with uncontrolled proliferation and survival, unlimited replicative potential, and invasive growth. Emerging evidence has highlighted the functional importance of non-coding RNAs, particularly microRNAs (miRNAs), in the initiation and progression of tumor development. The mir-17-92 miRNA is among the best characterized miRNA oncogenes, whose genomic amplification or aberrant elevation are frequently observed in a variety of tumor types. Unlike protein-coding oncogenes, where one transcript produces one protein, mir-17-92 encodes a polycistronic miRNA transcript that yields six individual miRNA components. This unique gene structure, shared by many important miRNA oncogenes and tumor suppressors, underlies the unique functionality of mir-17-92 in a cell type and context-dependent manner. Recent functional dissection of mir-17-92 indicates that individual mir-17-92 components perform distinct biological functions, which collectively regulate multiple related cellular processes during development and disease. The structural complexity of mir-17-92 as a polycistronic miRNA oncogene, along with the complex mode of interactions among its components, constitutes the molecular basis for its unique functional complexity during normal and tumor development.

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